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Mazdoor Kisan Shakti Sangathan

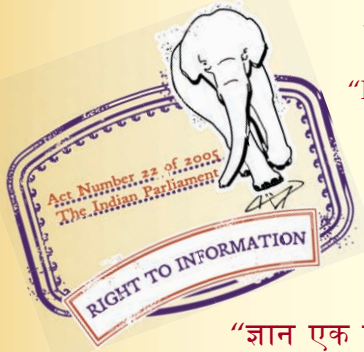
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Jawaharlal Nehru

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IS 6 (1983): Moderate Heat Duty Fireclay Refractories,
Group 'A' [MTD 15: Refractories]



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Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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Indian Standard

SPECIFICATION FOR
MODERATE HEAT DUTY FIRECLAY
REFRACTORIES, GROUP 'A'

(Fourth Revision)

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SPECIFICATION FOR MODERATE HEAT DUTY FIRECLAY REFRACTORIES, GROUP 'A'

(Fourth Revision)

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Indian Standard
SPECIFICATION FOR
MODERATE HEAT DUTY FIRECLAY
REFRACTORIES, GROUP 'A'
(*Fourth Revision*)

0. FOREWORD

0.1 This Indian Standard (*Fourth Revision*) was adopted by the Indian Standards Institution on 21 April 1983, after the draft finalized by the Refractories Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 Fireclay refractories are classified into 'high heat duty' and 'moderate heat duty' refractories, the latter being sub-divided into two groups, namely, Group A and Group B on the basis of certain well established properties. This standard deals with moderate heat duty fireclay refractories of Group A.

0.3 This standard was first issued in 1949 and subsequently revised in 1953, 1958 and 1967. In this revision an additional variety of moderate heat duty fireclay refractories has been included and the requirements for this have been specified separately as 'Type 2 refractories'. The spalling resistance test has been retained in this standard as an optional requirement for both Type 1 and Type 2 refractories.

0.4 It is to be pointed out that although a number of tests have been prescribed in this standard, it is not intended that all of them should be carried out in each case, as by a judicious application of some of the tests it should be possible to judge the quality of bricks in a given lot. However, the tests to be conducted in each case would depend upon the service conditions for which the bricks are required. Purchasers are, therefore, advised to indicate these conditions at the time of placing an indent or order.

0.5 This standard keeps in view the manufacturing and trade practices followed in the country in this field.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements for moderate heat duty burnt fireclay refractories, Group 'A' for general purposes.

2. SUPPLY OF MATERIAL

2.1 General requirements relating to the supply of moderate heat duty fireclay refractories shall be as laid down in IS : 1387-1967†.

2.2 The refractories shall be compact, of homogenous texture and free from cracks, voids and other flaws. They shall be burnt evenly throughout shall have no soft corners and have sufficient mechanical strength.

3. TYPES

3.1 Moderate heat duty fireclay refractories Group 'A' shall be of the following two types:

Type 1 — suitable for general applications, and

Type 2 — suitable for more critical application, like steel plant usage.

4. CHEMICAL COMPOSITION

4.1 The alumina and silica contents of both the types of refractories, when determined in accordance with the methods given in IS : 1527-1960‡, shall be as follows:

	Percent
Alumina, <i>Min</i>	30
Silica, <i>Max</i>	65

NOTE — The aluminium content may also be determined according to the methods given in IS : 1335-1959§.

*Rules for rounding off numerical values (*revised*).

†General requirements for the supply of metallurgical materials (*first revision*).

‡Methods for chemical analysis of fireclay and silica refractory materials (*first revision*).

§Methods for direct determination of silica in refractory materials (*first revision*).

5. PHYSICAL TEST REQUIREMENTS

5.1 Moderate heat duty fireclay refractories, when tested in accordance with the test methods specified, shall conform to the requirements, given in Table 1.

TABLE 1 PHYSICAL TEST REQUIREMENTS

Sl. No.	CHARACTERISTIC	REQUIREMENT		TEST METHOD (REF TO PART OF IS : 1528-*)
		Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)
i)	Apparent porosity, percent by volume, <i>Max</i>	25	23 25 (for hand mould- ded shapes)	Part 8
ii)	Cold crushing strength, MPa, <i>Min</i>	20	22.5 17.5 (for hand mould- ded shapes)	Part 4
iii)	Pyrometric cone equival- ent, standard cone (ASTM) No., <i>Min</i>	30	30	Part 1
iv)	Refractories under load, <i>ta</i> °C, <i>Min</i>	1 300	1 300	Part 2
v)	Permanent linear change after heating at 1 350°C or 5 h, percent, <i>Max</i>	1.0	1.0	Part 6
vi)	Spalling resistance test	Subject to mutual agreement	Subject to mutual agreement	

NOTE — The requirements of apparent porosity and cold crushing strength in case of special shapes to be hand-moulded, conforming to Type 1, shall be as agreed to between the purchaser and the manufacturer.

NOTE 2 — 1MPa = 10.2 kg/cm².

*Methods of sampling and physical tests for refractories:

Part 8 Determination of apparent porosity (*first revision*).

Part 4 Determination of cold crushing strength (*first revision*).

Part 1 Determination of pyrometric cone equivalent (BCE) or softening point (*second revision*).

Part 2 Determination of refractoriness under load (*first revision*).

Part 6 Determination of permanent change after reheating (*first revision*).

6. TOLERANCE ON SIZE

6.1 Variation from specified dimensions, covering both warpage and shrinkage, shall be allowed to the extent of ± 2 percent or ± 1 mm whichever is greater for Type 1 refractories and ± 1 percent or ± 1 mm whichever is greater for Type 2 refractories.

6.2 The size tolerance for hand-moulded shapes shall be as mutually agreed to between the purchaser and the manufacturer.

7. SAMPLING

7.1 Representative samples shall be drawn according to the scheme of sampling given in IS : 1528 (Part 7)-1974*.

8. MARKING

8.1 Each refractory brick or shape shall be clearly marked with the manufacturer's name or trade-mark.

8.1.1 Refractory brick or shape may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

*Methods of sampling and physical tests for refractory materials: Part 7 Methods of sampling and criteria for conformity (*first revision*).